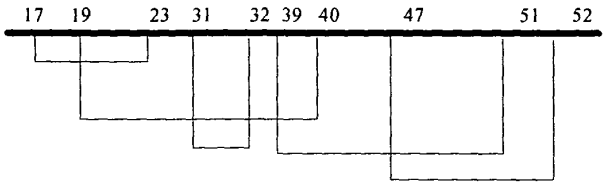
Figure 4



Log, with LSNs of 1st and last (commit) record marked for each delta

Deltas sent to target

Delta	timeStamp	seqNum
δ_1	23	1
δ_2	32	2
δ_3	40	3
δ_4	51	4
δ_5	52	5

Occasional Heartbeats to Monitor Service

inFlightLSN	timeStamp
19	23
47	51

Figure 5

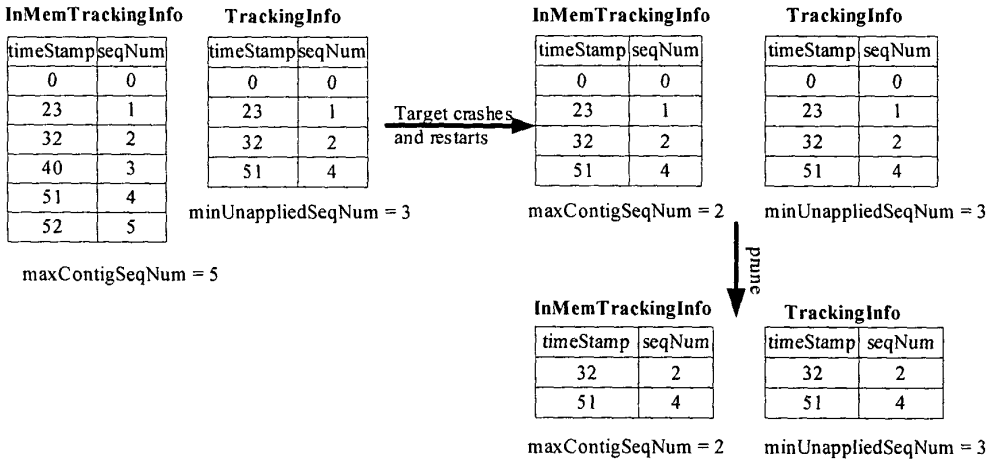
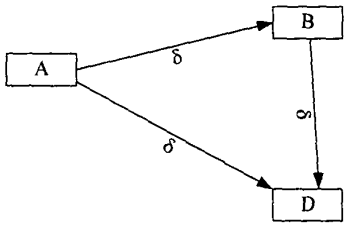


Figure 6



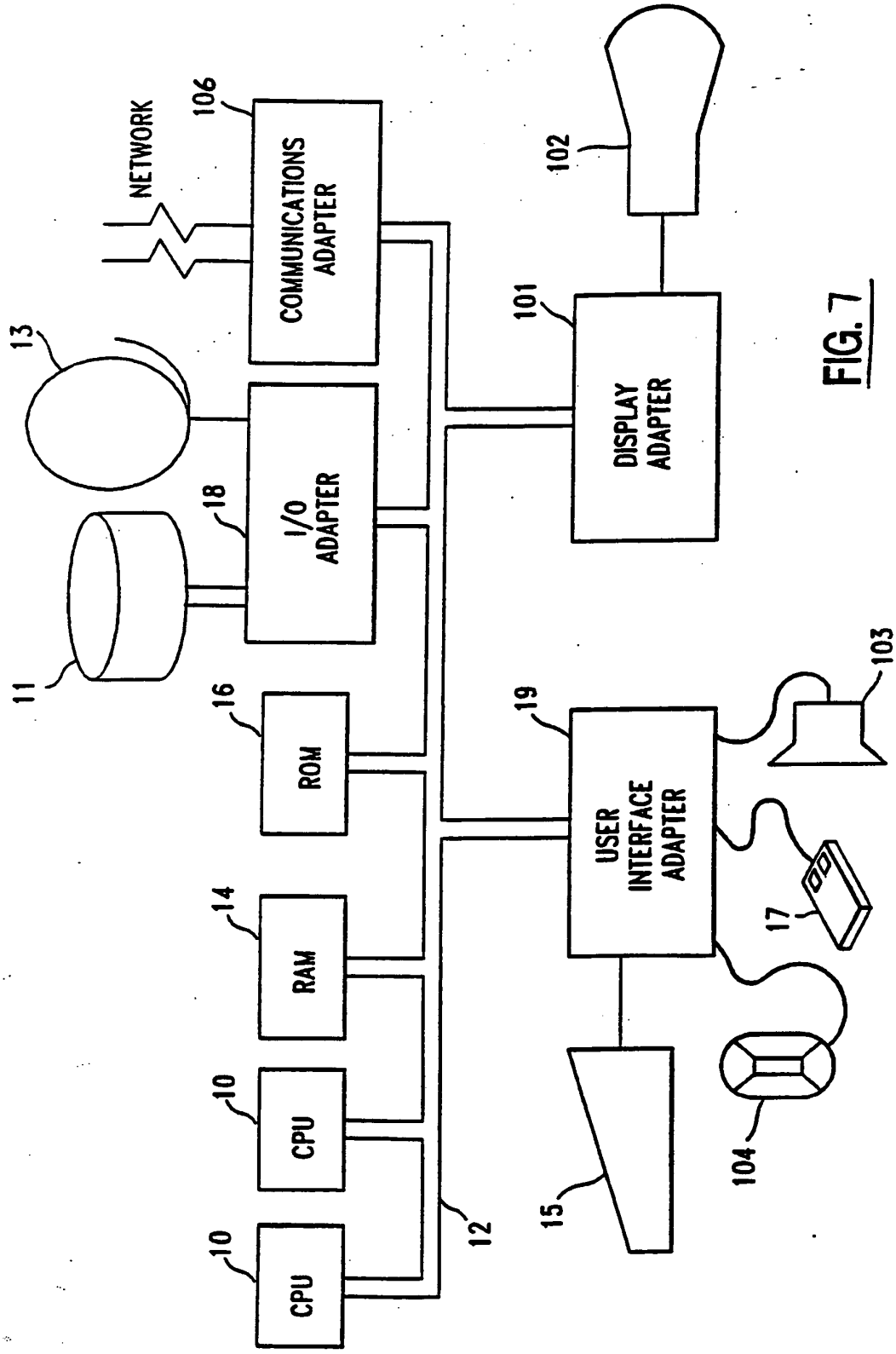

NETWORK
106
COMMUNICATIONS ADAPTER
102
101
DISPLAY ADAPTER
13
18
I/O ADAPTER
11
16
ROM
19
USER INTERFACE ADAPTER
103
14
RAM
17
10
CPU
104
15
10
CPU
12

FIG. 7

Figure 8

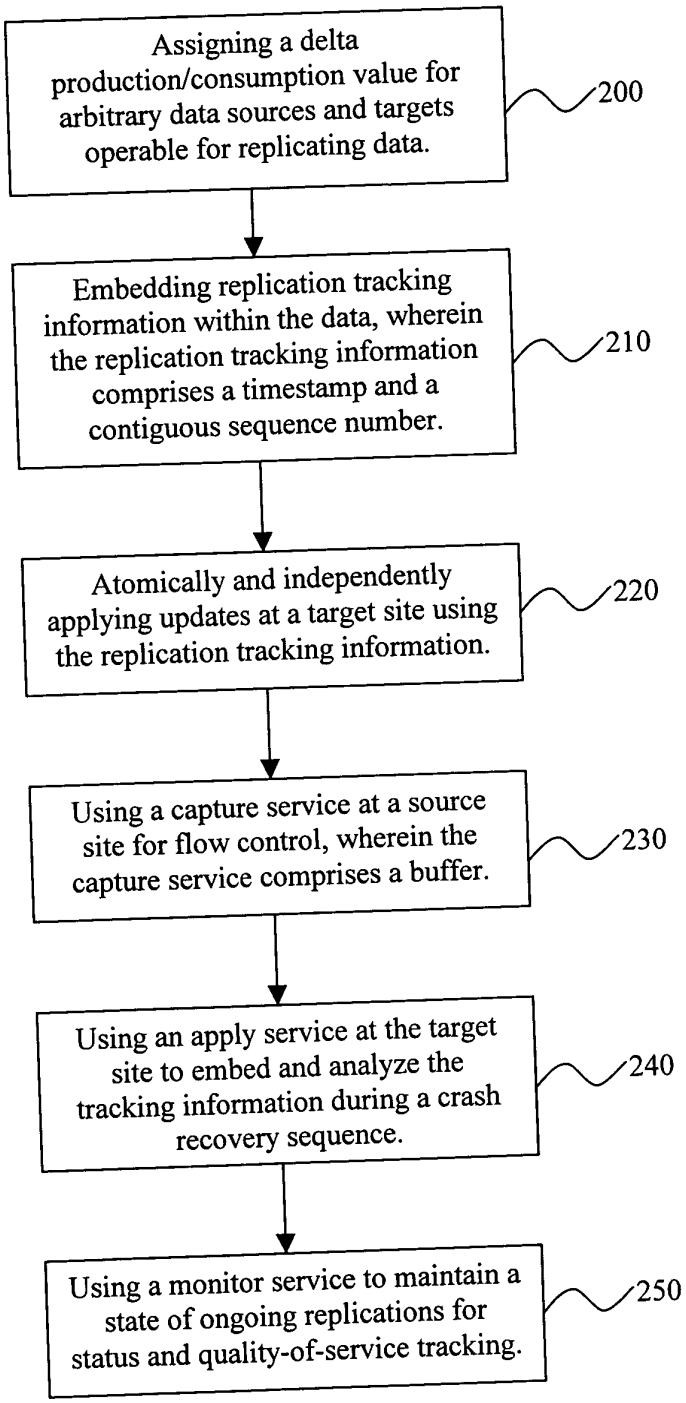

Assigning a delta production/consumption value for arbitrary data sources and targets operable for replicating data.
200
Embedding replication tracking information within the data, wherein the replication tracking information comprises a timestamp and a contiguous sequence number.
210
Atomically and independently applying updates at a target site using the replication tracking information.
220
Using a capture service at a source site for flow control, wherein the capture service comprises a buffer.
230
Using an apply service at the target site to embed and analyze the tracking information during a crash recovery sequence.
240
Using a monitor service to maintain a state of ongoing replications for status and quality-of-service tracking.
250

Figure 1 (Prior Art)

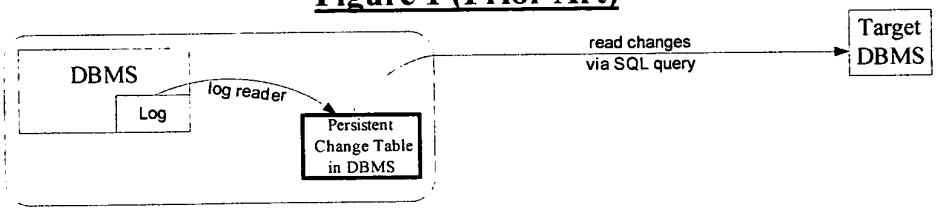


Figure 2 (Prior Art)

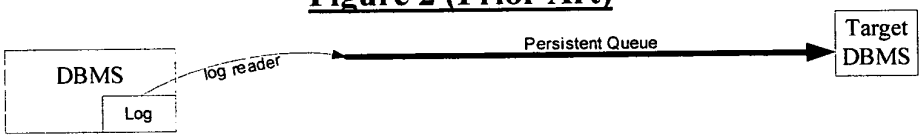
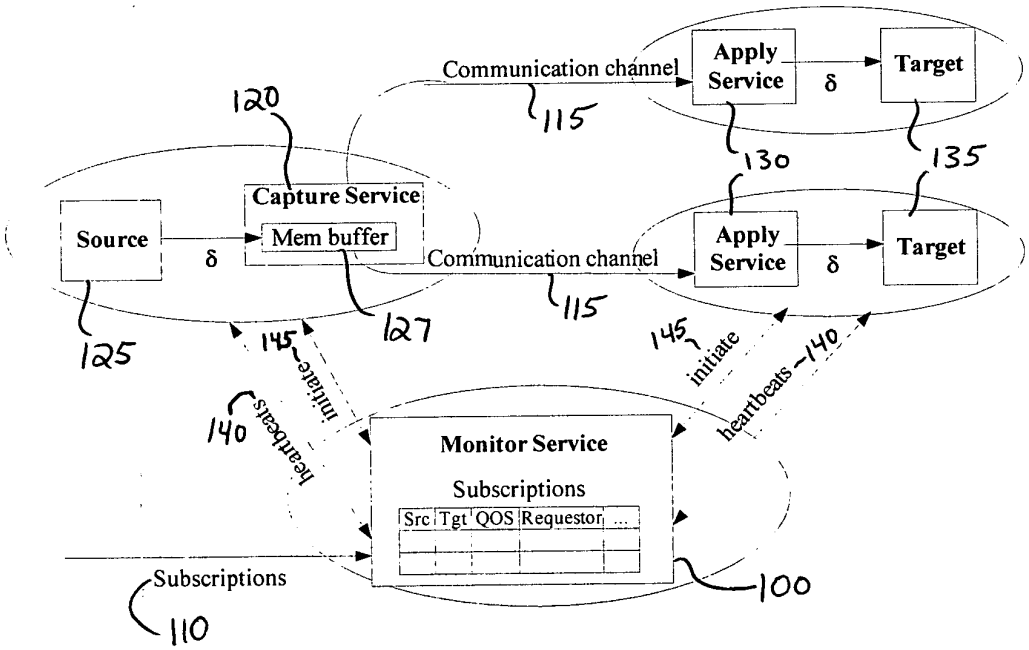



Figure 3